REMARKS

The subject invention relates to an improved approach for operating a gas discharge laser. More specifically, in operation, the temperature of the gas within the discharge chamber is monitored. In addition, the temperature of the discharge chamber itself is also monitored. This information is supplied to a temperature regulation controller which is operative to adjust the flow of cooling fluid to the heat exchanger. The controller utilizes information from both temperature measurements to control the fluid flow.

In the Office Action, the Examiner rejected claims 23 to 27 as being anticipated by Partlo (6,021,150). As discussed in the Applicants' previous response, Partlo discusses the operation of a test laser (see Figure 6) which includes sensors for monitoring the temperature of the gas in the discharge chamber as well as the temperature of the chamber itself. However, it is clear from the Partlo specification that this laser is operated in one of two modes. In the first mode, the cooling is controlled only in response to the temperature of the gas in the discharge. In the other mode, the cooling is controlled only in response to the temperature of the discharge chamber. This experiment was meant to prove that controlling cooling in response to measuring the gas temperature was better than controlling cooling in response to the measurement of the chamber temperature. Partlo never discloses or suggests that the cooling fluid should be controlled in response to both measurements.

In paragraph 7, the Examiner indicated that the arguments of the Applicants were not persuasive because the claims were not limited to using information from both sensors. In addition, the Examiner argued that the specification did not explicitly teach using information from more than one sensor at the same time.

In response, Applicants have amended the independent claims to make it clear that control of the cooling system is in response to the output of both sensors. One skilled in the art would clearly understand that that the laser described in the instant application would be operable in this fashion. First, Figure 4 shows that the outputs of both temperature sensors are supplied to the PID (proportional, integral, differential) controller. The flow chart of Figure 5 confirms that these temperature signals are supplied to the controller. As shown therein, the controller can also examine pulse patterns and energy and heat dissipation factors. The controller will use all of these inputs to vary the amount of cooling fluid entering the heat exchanger.

The specification is consistent with the drawings as shown below.

A first temperature sensor **412** can be used to monitor the temperature of the laser gas in the tube. This embodiment also utilizes a second temperature sensor **410** to monitor the temperature of the body of the laser tube **406**. A third temperature sensor **414** can monitor the temperature of the cooling water **414** being input into the system. (page 6, line 6)

The temperatures from these temperature sensors **410, 412, 414** can be received by a temperature regulation controller **416**, which can be a PID controller. (page 6, line 13)

The temperature regulation controller can utilize the **temperatures** and the control signal to adjust the flow control valve **404** in order to adjust the amount of cooling water flowing through the heat exchanger **408**. (note plural use of the term temperatures at page 7, line 2)

The temperature regulation controller can receive a feedback signal from **each of the various temperature sensors in the feedback loop**, such as a sensor for the tube temperature and a sensor for the gas temperature inside the tube. (page 10, line 31, emphasis added)

The temperature regulation controller can evaluate the temperature and dissipation signals, and can determine any appropriate adjustment to the system. (page 11, line 4)

There should be no doubt that the specification teaches that the controller will use both temperature measurements to control the flow of cooling fluid. As noted above, this mode of operation is not taught or suggested in Partlo. Indeed, Partlo teaches away from this concept since his intent is to simply demonstrate the superiority of controlling the cooling fluid based solely on measuring gas temperature.

Accordingly, it is respectfully submitted that the patent to Partlo, which merely teaches control of the cooling fluid using a single temperature sensor, fails to anticipate or render obvious Applicants' invention which requires that the control of the cooling fluid be based on the input from two different temperature sensors.

Claim 28 was rejected as being obvious based on the patent to Partlo in view of the patent to Meier (5,617,440). The patent to Meier was cited for its teaching of a metallic housing serving as an oven for setting the temperature of the laser tube. Meier monitors light output from the laser to control the temperature of the laser tube. Meier does not disclose the use of any temperature sensors. Accordingly, the patent to Meier fails to overcome the deficiencies of Partlo in teaching or rendering obvious Applicants' invention.

Claim 29 was rejected as being obvious based on the patent to Partlo in view of Ujazdowski (6,034,978). Ujazdowski, which only teaches the use of a single temperature sensor, fails to overcome the deficiencies of Partlo in teaching or rendering obvious Applicants' invention.

Based on the above, it is submitted that amended independent claims 23 and 26 define patentable subject matter and allowance thereof, along with the claims depending therefrom is respectfully requested.

Respectfully submitted,

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